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Fowl Diphtheria and Pox.

Some Experiences of the Disease and its Treatment in Holland.

By Welleman Brothers, Poultry Breeders, Buurmalsen.

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One would be inclined to believe that after all that has been said about diphtheria and pox during past years the majority of poultry keepers would fight shy of the irreparable damage done by this disease to their stock as well as to their pockets, and that in consequence they would seek diligently for methods to combat it and put in force those measures that have proved efficacious.

The query columns of our papers devoted to poultry raising as well as the ever-increasing advertisements of medicines for the prevention or cure of diphtheria and pox show us that, with the increase of poultry raising, the above-mentioned diseases increase too, proving that neither shame nor damage make for precautions in every case. Every year the greatest part of the 7,000,000 head of fowl kept in the Netherlands is attacked by diphtheria or pox, mostly in the period between October and February; that is to say, in the cold and wet season.

These two names stand for two forms of the same very contagious disease. One speaks of diphtheria when a yellowish cheese-like mass develops on the mucous membranes of the mouth, throat, nostrils and eyes; and of fowl pox when greyish spots which later on turn brown appear on the comb, ear lobes, wattles, and sometimes on the skin of the neck. In most cases these two forms of manifestation may be noticed on the same fowl. The innocent-looking yellow patches inside the mouth and the brownish warty crusts on the comb and wattles seem to attack fowls very violently, because all those affected stop laying and only commence to lay again some months later. Many hens, however, never lay again or only an egg now and then.

Considering that the disease mostly appears at a period when the price of eggs is high, one can understand that reduction in the egg supply, which is caused by this disease, means a serious loss to Dutch poultry farmers, a loss that surpasses F.1,000,000.

It is no wonder, then, that in countries where poultry raising is an important source of prosperity, which it is in every country at the present time, science has mobilised its genius and energy to overcome this menace. Dutch science has not remained in the background, but has undertaken this work with fruitful results. It was known that the disease was caused by a virus, which was transmitted easily by means of drinking and feeding troughs from affected fowls to healthy ones, which in their turn became infectious.

A vaccine was therefore sought which would, when injected into the healthy fowl, render it proof against diphtheria and pox, just in the same manner as we protect ourselves against smallpox.

Great interest was shown in Holland when Professor Beach, of the Berkeley University of California, delivered a speech at the World Poultry Congress at The Hague in 1921, on the fight against poultry diseases in the United States of America and gave the results achieved by injections made with a vaccine prepared by him to prevent diphtheria and pox.

The following is a resumé of results: When half the number of healthy fowls were vaccinated in an infected poultry yard, and the other half were not, only 11 per cent. of those vaccinated became infected, whilst 78 per cent. of the non-vaccinated contracted the disease. Of the attacked non-vaccinated fowls 38.9 per cent. died, whereas of the attacked vaccinated only 19.6 per cent. succumbed. The period after vaccination before the fowls were rendered immune varied from two months to two years. A great difference was also noted in the various degrees of protection which the injections gave against strong artificial infection, the difference of which according to Beach was caused by the various and uncontrollable grades of the virus in the pock-eruptions of the different fowls, from which Beach's vaccine was made.

In spite of the important advantages Beach's vaccine gave they yet remained very far from the ideal. Beach recognised the shortcomings of his vaccine and advised breeders to use it only to check the spreading of the disease in an already infected yard; but not to use it with the object of protecting fowls against a possible future infection. Although the above was an advance not to be undervalued, a vaccine must guarantee absolute and, as Beach stated, a lasting protection against future infection, if it is to be of practical use to us poultry breeders.

If every case of diphtheria or pox that takes place during the year among our poultry requires re-vaccination of tens, hundreds and sometimes thousands of our fowls just to save only a part of them from disease, the cost of the vaccination and the loss in eggs caused by the malady, there can practically be nothing to be said in favour of vaccination viewed from an economical point of view.

Happily Dutch science has not remained idle since the time Beach made his statement in 1921, but has surpassed the results achieved by that authority.

After several years of laborious work and many attempts, Professor de Blieck and Dr. van Heelsbergen,

respectively Director and Conservator of the Institute of Parasitic and Contagious Diseases in the Veterinary School of Utrecht, succeeded by a very original method in preparing a vaccine which fulfils all the necessary qualities of a reliable immunising material against diphtheria and pox.

The method of vaccinating fowls, which in Holland can only be carried out by a veterinary surgeon, as there no serum or vaccine is allowed to be issued to laymen, is very simple. It consists in rubbing a small quantity of the vaccine on the bared space on the thigh of the fowl. It is practically a painless operation, the reaction (or taking) is not intense, and complications seldom arise. This is important and valuable, but what is still more valuable in De Blieck and van Heelsbergen's vaccine is that it gives immunity against diphtheria and pox practically for the lifetime of a fowl.

This important event, this happy message to all poultry breeders in Holland, has already appeared earlier in periodicals devoted to poultry breeding, without awakening that interest which it deserves so much, for among the hundred-thousand poultry keepers in our country there are unfortunately but a handful who treat their young fowls every year with de Blieck and van Heelsbergen's vaccine. Do they not take into account the loss of eggs in consequence of this disease in their fowls, and the food that is wasted on the affected birds? Do they not estimate the amount of money they throw away on quack medicines? Do they not take note of the loss in daily wages entailed by the treatment to which they subject their sick birds? And do they not think it is worth while to spend a trifle on a method which, if applied in time, would save much trouble, disappointment and loss?

We, too, before we knew of the de Blieck and van Heelsbergen vaccine, wrestled every winter with this disease, and lost capital through it. It happened that we had to treat daily 200 or more fowls with iodine, which cost us a lot in wages, not counting the disappointment that one feels when fighting an all-powerful opponent; all this disheartening has now ended since we took to treating our young fowls every autumn with de Blieck and van Heelsbergen's vaccine.

In 1922 we made the acquaintance of Dr. H. t'Hoen, from Utrecht, who is well-known in poultry breeding circles, and who was working at that time in the laboratory of Drs. de Blieck and van Heelsbergen. We were persuaded in such a way by him to try the vaccine that we decided to do so in spite of the fact that we had been disappointed with others, which were prepared by a different method. The vaccine we used formerly gave a serious reaction, so much so that we despaired of the lives of some of our fowls; but others did not show any drawbacks, and even the worst completely recovered within a fortnight and were laying eggs. We did not lose a single fowl.

By varying their method of preparation Messrs. de Blieck and van Heelsbergen succeeded last year in turning out their vaccine in such a way that only a slight reaction follows the innoculation, but guarantees absolute immunity against diphtheria and pox; not the slightest disturbance of the fowls so treated by it can be noticed.

During 1922, 1923 and 1924 Dr. t'Hoen vaccinated 3,000 of our young fowls, and in 1922 another 200 older ones besides. Though, as we remarked above our fowls were attacked by the disease in great numbers every winter, we have not discovered since 1922, after treatment, a single case of diphtheria or pox, neither among the young nor old fowls, so that a single vaccination for the whole period one keeps a fowl is practically sufficient.

Through an overlooked for event our boundless confidence in the de Blieck and van Heelsbergen vaccine became, if anything, firmer than ever. Not having given it our thought, our turkeys (white, bronze and American Mammoth) had never been vaccinated, and we had never noticed any signs of the disease amongst them. In November of last year we discovered, however, that five out of the twenty turkeys that were with White Wyandottes, and the Reds were attacked with diphtheria and pox, and later on all twenty were suffering from the malady.

Knowing that fowls, unless made proof against the disease by means of the vaccine, would be liable to contract the infection from the turkeys, we decided to test the efficacy of the vaccine by leaving the turkeys and fowls together, merely treating the sick turkeys with iodine. To our great delight we found that during the five weeks our turkeys were suffering from diphtheria and pox, and also after, not a single Wyandotte or Red shewed the slightest trace of the malady, notwithstanding that the affected turkeys and healthy fowls were housed together, used the same run and fed and drank out of the same troughs so that the chances of getting infected were as great as they could be.

We have heard of similar wonderful results in every instance where poultry breeders used the vaccine on our advice. We had already made up our minds at the beginning of this year, immediately after the events related above in regard to the turkeys to repeat the same through the press, and to warn our professional and sporting associates not to allow their poultry stocks to be over-run by diphtheria and pox invaders, and to establish the immunity of them by the use of the de Blieck—van Heelsbergen vaccine.

By adopting the treatment in time, before any signs of the disease can be discovered or even expected, early vaccination guarantees not only immunity against the malady, but also a non-break in the egg yield of the hens as it would after the disease had put in its appearance. To postpone it would mean financial loss. There are no reasons remaining why vaccination should not be adopted.

The expense need not be an obstacle as it seldom exceeds twopence per fowl, or only two-thirds the price of a winter egg.

Since nearly every hamlet possesses its own Poultry Keepers' Association any difficulty should be easily overcome.

When the Committee of Association will again point out the great importance of vaccination against diphtheria and pox the intelligent members will, no doubt, furnish the total number of fowls to the Association they wish to be vaccinated. The Association will then fix a certain date for the vaccination to be carried out, on the day fixed and made known beforehand to the poultry farmers, who would have to keep their fowls shut up, so they can be vaccinated without any unnnecessary loss of time. Besides two men, who will be told off by the Association to assist, the co-operation of the owners and their families will be a great help in catching, holding and passing on the fowls.

For the sake of carrying through the day's programme in an orderly and expeditious manner it is desirable to fix the order in which the members will be visited and to let the same know the exact time beforehand. Six hundred fowls could be vaccinated within 8 a.m. and 7 p.m., that is if the farms are not too far apart. Diphtheria and pox with their trail of vexation and financial loss can be made to disappear for ever from poultry breeding. Doctors de Blieck and van Heelsbergen told us that years ago and now, after three years' experience, we and many others, amongst whom we can mention the Trial Poultry Breeding Station at Beekbergen and the Poultry Breeding Station of the Leniburg and North Brabant Farmers' Union at Horst, can repeat it.

Before closing, we feel it our duty to write a word of thanks to all those Dutch scientists, who have of late supported in a very energetic manner the interests of our poultry breeding and to tender our especial congratulations to Professor de Blieck and Dr. van Heelsbergen on the important results that have crowned their labours, and with which they have for ever indebted the entire body of the Dutch poultry breeders.

The Rational Medication of Birds.

(B. F. KAUPP, in *Veterinary Medicine*, Chicago).

" In the medication of birds we have a problem quite different from that of the medication of live stock. In fact, the problems of rearing, handling, marketing and other matters in relation are so much different from those of live stock that the more progressive agricultural colleges have separated poultry from live stock, giving it a separate department or division as the college organisation may require.

" In this article an effort will be made to point out the most rational methods of attack of the problem of giving medicine to birds.

" In spite of the fact that the bird has no epiglottis, the glottis seems to close tightly during ordinary times in the act of deglutition, but when the bird is struggling the glottis may open at a time when you are pouring liquid down the throat, and thus I have seen more than one fatal attack of pneumonia or of bronchitis follow attempted drenching. The old method of medication of birds was by making dough balls; more modern methods saw this pass to the placing of the powdered drugs in capsules and, dipping a capsule in water, opening the bird's mouth and throwing the capsule back into the pharynx, watching the bird so that it does not throw the capsule out but swallows it. This has been very successful, or, using the ink bag of a fountain pen passing a wire inside the tube so as to make a balling gun and inserting the capsule in the end of the rubber tube it will be found very easy to pass the capsule down the esophagus and push it out with the plunger. The most modern way is the making of a prescription into tablet form and giving a tablet to each bird. This is safe where the dosage must be large and close to the border line and, you might say, is not foolproof. It has been our experience that where medicine is not fool proof and it is given for mass medication, trouble may occur by careless use of the drugs and even fatalities result. Modern poultry husbandry means the keeping of two, three, four, or more thousand birds on the commercial farms where disease might appear and be of a serious character and so another method must be found than described above. This calls for mass treatment. By that I mean giving the medicine in the mash or in the drinking water so that each bird will get its amount and no more. To illustrate we will take the matter of medicating for intestinal parasites.

" We have found that one of the worst enemies of the poultry plant is that of intestinal worms. In autopsies of 500 adult fowls in these laboratories we have found that *Heterakis papillosa* infested 31·4 per cent. of the birds, tænia 12.8 per cent., *Ascaris inflexa* 29·7 per cent., *Spiroptera hamulosa* (gizzard worm) 19·1 per cent., and other diseases of a parasitic nature included scaly legs 9 per cent., lice 27·6 per cent., and mites 1 per cent. In performing autopsy we can expect to come across some form of intestinal parasites in almost every other bird if they are from different sources. The fact that the worm eggs live so long on contaminated premises, some of them, as the *Ascaris inflexa*, living for more than five years, makes the problem all the more serious. How are you going to medicate 1,000 or more chickens ?

" To do this job the medicine may be mixed with the drinking water. In the case of Epsom salts, the cathartic which is best adapted to poultry, it is dissolved in the drinking water. Poultry have a tendency towards constipation in their rather sedentary habits under the commercial factory method, and salts (one half pound to 100 birds) once a month keep the eliminative organs open. Digestive troubles are the cause of the largest number of deaths as we have shown in a survey of 500 complete autopsies on adult fowls where 22 per cent. were of the digestive tract, 15 per cent. septicæmic (this high percentage is on account of the fact that fowl typhoid is common in our state and many fowls are sent in for diagnosis), glandular diseases 14 per cent., and nervous 12 per cent.

" From these *data* it will be seen that those veterinarians who give attention to poultry diseases will be called upon pretty heavily for treatment for worms. When tape worms are present there should be given

one grain of finely pulverised thymol to each bird and this can be mixed with the medicine for round worms. Nicotine is the best drug for round worms and may be given in the form of "Black leaf 40," using one ounce to the 100 hens. If flock medication is used then great care must be exercised to see that all birds eat at the same time so that one bird will not get an overdose, for if the overdose be large enough, it will constitute a lethal dose. All birds do not react the same to nicotine, some birds will stand a larger dose than others. To give this medicine mix the blackleaf 40 with sufficient water to mix with mash so that each bird will have one ounce of mash. With this liquid add one half-pound Epsom salts to each 100 birds. When the mash wet with this mixture is given, it must be given in long troughs so that each bird can get to the trough at the same time. This blackleaf 40 can be in capsules so that each bird can be given its exact dose, and the Epsom salts then may be given in the drinking water or may be mixed in a dry state with the mash. Use 6·6 c.c. of blackleaf 40 to 16 grams Lloyd's alkaloidal reagent. Mix and fill No. 2 gelatin capsules.

"Iodin is one of the most useful remedial agents in the materia medica for poultry practice. In abscesses of the feet, of the infraorbital sinuses and in other parts after the cheesy material has been removed, swab out the wound and cavity with pure iodin. Ulcerative stomatitis, pharyngitis and laryngitis (of the superior larynx) are quite common among poultry, being largely due to the chicken pox organism. After the cheesy material has been scraped off, thoroughly swab the part with pure iodin. Repeat once a day. In ulcerative laryngitis affecting the superior larynx, a curette is often needed to remove the small amount of cheesy inflammatory product that has accumulated at that point. Then swab the part.

Quite heroic treatment of roup or infectious nasal catarrh has been given by injecting pure iodin through the nasal cavity, also the application of pure iodin in in case of chicken pox and painting the parts once a day in cases where a counter-irritant is indicated, such as dermatitis and swellings of the face, comb, and wattles.

Finally, iodin mixed with vaselin, or the so-called soluble iodin sold under the trade name Iodex, is useful in ulceration of the anus and cloaca commonly called vent gleet. Iodin is also used to disinfect the surface before an operation and of wounds.

British Pigs for the Continent.

The National Pig Breeders' Association announce that the first conference of British pig breeders and feeders held this year having proved successful, the Association are endeavouring to arrange another to be held in London, the probable date being April 14th. The Association further state that a considerable demand for white pigs from the mid-European States is expected during 1926. Three boars and five sows of the Wharfedale herd of pedigree middle white pigs have recently been sold for export to Yugoslavia, where, it is stated, efforts are being made to rehabilitate the pig breeding and feeding industry. Serbia is also purchasing middle white pigs from this country, and during the past week exports have gone from Essex and Cambridgeshire.

The Toxicity of Carbon Tetrachloride to Cats: a Warning.*

By Asa C. Chandler, M.S., Ph.D., and R. N. Chopra, M.A., M.D. (Cantab.).

On account of conditions which made it difficult to keep dogs under observation for experimental work, we attempted to use cats for a number of experiments on the toxicity of carbon tetrachloride under various conditions of diet, etc. In all we have given carbon tetrachloride to 87 cats, in various dosages and under various dietary conditions and have found the susceptibility of cats to this drug so great that it was impossible to get more than suggestive results from our various experiments. Ninety-two per cent. of the cats died or were killed in a dying condition, regardless of dosage or diet.

Hall and Shillinger (1923) state that carbon tetrachloride at the rate of 0·3 c.c. per kilo. is well tolerated by cats, and report ten experiments on five kittens, with doses of carbon tetrachloride ranging from 2 c.c. to over 11 c.c. per kilo., of which only two, receiving over 9 c.c. per kilo. each, died. Two of the kittens were treated three times, some of the doses being as high as 7 and 8 c.c. per kilo. These authors also report a statement by Dr. O. V. Brumley of the Ohio State University that "it (carbon tetrachloride) has been a great help, particularly in the treatment of hookworms in dogs and cats," and they record Dr. Buckingham of Washington as reporting favourably on the use of carbon tetrachloride in cats. Hall and Shillinger conclude that, in so far as conclusions can safely be drawn from their experiments, carbon tetrachloride has a wide margin of safety for cats, between the therapeutic dosage of 0·3 c.c. per kilo. and the minimum lethal dose, and that members of the Felidæ as well as the Canidæ are highly tolerant to the drug.

Relying on these conclusions, we selected 0·5 c.c. per kilo. as an experimental dosage, thinking that this would probably produce sufficient damage in unprotected animals so that an improvement could be noticed readily if we were successful in protecting the animals against the effects of the drug. The carbon tetrachloride we used is the same as that used in our hospital for human cases, is free from carbon bisulphide and phosgene, and conforms to the other usual standards of purity for cabon tetrachloride.

As a preliminary, we administered 0·5 c.c. per kilo. to six full grown cats (1,600 to 3,000 grams) by stomach tube about three hours after food. Of these six, three died on the second day, two more on the third day, and the last one, which was dying, was killed on the same day. This result was so much at variance with what we had expected from Hall and Shillinger's results that we repeated the experiment, using kittens weighing from 670 to 940 grams, similar to those used by Hall and Shillinger. Of these six, two died on the second day, two died on the third day, one which was in a dying condition was killed on the same day, and the sixth one died on the fourth day. In another

*Reproduced from the September issue of *The Indian Medical Gazette*.

batch of full-grown cats, one died on the day following treatment, and all the other five died on the second day. It is needless to go into detail here regarding the attempts at protection against the effect of carbon tetrachloride which we tried, since these will be fully discussed in another paper. Suffice it to say that nothing we tried in the way of diet, purging or other preparation succeeded in saving more than two out of six cats, and this only in one instance; the best we could do in most cases was to delay death to the third and fourth days instead of the second and third days. In four cases death occurred on the fifth day, and in three instances the cats did not die until the sixth, eighth, and eleventh days respectively. Of 49 cats which were given 0·5 c.c. per kilo., only 4 survived; of 27 which were given 0·25 c.c. per kilo., 3 survived; and of 12 given 4 c.c. per kilo., all died. We had no difficulty with vomiting in the case of the smaller doses, but ten of the twelve which were given 4 c.c. vomited within about half an hour. Altogether 8 cats out of the 87 died on the day following treatment, 30 on the second day, 23 on the third day, 7 on the fourth day, and 4 on the fifth day; 5 were killed when in a dying condition, and 7 survived. Four of the eight which died on the day following treatment had vomited, from which we deduce that very likely death was hastened by inhalation of carbon tetrachloride from the vomitus.

We cut sections of the liver and kidney of all these cats, and sections of the spleen, suprarenal, and intestinal wall of many of them. We found no significant changes in the spleen, and in only a few instances we found slight damage of the outer cortical cells of the suprarenals, which was quite in contrast with the necrosis reported by Phelps and Hu (1924). The intestinal wall in some instances showed the villi severely congested and occasionally denuded of the epithelium. The really important lesions were found in the liver and kidneys. The liver in every instance showed the central necrosis which is so characteristic of carbon tetrachloride, and usually a very extensive fatty degeneration was present. From 25 to practically 100 per cent. of the liver tissue was damaged even in cats which received only 0·25 c.c. per kilo. Most remarkable, however, were the lesions found in the kidneys, and in many if not most instances we believe that the renal rather than the hepatic damage was the actual cause of death, and that the susceptibility of this organ in cats accounts for the much greater toxicity of carbon tetrachloride for cats than for dogs. The convoluted tubules show extensive fatty degeneration and frequently necrosis, but the collecting tubules are as a rule little affected; there is often desquamation—sometimes very extensive—of Henle's loops. The Bowman capsules are frequently infiltrated with blood, and the glomerular endothelium is swollen and the vessels dilated. In every instance in which we were able to obtain urine at autopsy there was albumen present, often in great quantity, and there was frequent evidence of blood.

(Continued at foot of next column.)

Insects in Relation to Public Health.*

By Sir WILFRED BEVERIDGE, K.C.B., C.B., D.S.O., M.B., D.P.H., Chadwick Medallist and Prizeman.

Apart from its value in economics and the prevention of disease, the study of insect life confers benefit on the individual, especially on those who intend to follow scientific professions, and its value in the education of youth is not to be ignored. A study of insect life generates the quality of accurate discrimination and develops the power of observation, and it is necessary to assemble facts to obtain ideas.

Mankind in general is rather too apt to regard things as important or otherwise, in proportion as they are concerned with its own interests. Even in accordance with this view there is no doubt that a study of insects must become productive of utility in many ways, and can be regarded as a useful concomitant of many branches of science, more especially that of medicine and hygiene. A study of insect life must also be important because when we suffer from them directly or indirectly from the result of their activities, if we do not know or understand the cause, we are unable to apply the remedy. Ignorance in this respect has often made us mistake our friends for our enemies. Take the case of the ladybird beetle, which from being commonly observed on beans, roses and other plants suffering from blight, was at one time considered to be the cause, but we know now that the damage is caused by a species of aphis, and that far from being an enemy, the ladybird is one of our most useful friends, since both the insect and its larva devour the destructive aphis by thousands, and thus the beetle should be protected and encouraged.

It is needless to enlarge on the importance of the study of insects in assisting to throw light upon the most obscure points in the transmission of those diseases termed insect-borne. At the present time, a knowledge of entomology is essential to every medical man, and no hygienist can expect to be successful unless he has had some training in this important science.

(Continued from previous column.)

We are quite at a loss to account for the striking differences between our results and those of Hall and Shillinger, but we are convinced that it is very unsafe to attempt the treatment of feline animals with carbon tetrachloride and therefore give warning against its use.

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*Chadwick Public Lecture, delivered on Wednesday, November 18th, in the Barnes Hall, Royal Society of Medicine.

Training in Medical Entomology, however, is restricted very largely to those who intend to enter the Public Health Service or who expect to practice medicine in the tropics. I think it should be more general and of wider scope. A knowledge of entomology likely to be of real value, must not be confined merely to the study of insects which are at present known to be injurious, but should be sufficiently comprehensive to enable the student to tackle any new problem which may arise, and give him the true entomological sense, which can only be acquired by a study of the life histories and habits of all the various genera of insects.

The chief function of insects in nature would appear to be the destruction of waste and putrescent organic matter and the suppression of superabundant vegetation. We are rather apt to undervalue the great benefit to mankind conferred by insects in the destruction of decaying organic matter. At the present time we devote much attention to the destruction of the house-fly and the carrion or blue bottle flies, and rightly so, because it has been definitely proved that they can, under some circumstances, transmit certain disease germs, either from infected matter to man, or even from man to man. They may convey the germs of typhoid fever, cholera, dysentery, diarrhœa, tuberculosis, and some other diseases. They may even carry the ova of certain parasitic worms, and hence their suppression is essential.

We are apt, however, to lose sight of the fact that originally the rôle of the fly in nature was to help in the destruction of offensive decaying organic matter, and, that if man took the proper precautions as to the disposal of infected excreta, and the protection of food, the fly would not be in the unfortunate position of being a disease carrier.

The fact that we are aware that insects can carry disease germs, and so infect our food and water, should serve as a warning, and thus stimulate us to be more careful of our personal hygiene, and in our surroundings. We should so regulate our sanitary efforts, as to make the insect carrier a negligible factor in the transmission of disease, and not concentrate all our energy in destroying insect life, while failing to put our own house in order.

Apart from the danger of insect borne disease, we encourage the increase of insect pests, simply because we allow our refuse to accumulate, and foster their breeding places. The house fly breeds chiefly in horse manure, and its prevalence we owe to the improper disposal of its food supply. Since the introduction of motor transport, the incidence of flies has decreased in many of our large cities. During the war, one could at once assess the sanitary condition of a camp or billet by the presence or absence of flies.

There is no doubt that insects might subserve greatly more to our advantage and profit than at present, if only we understood them better.

We might encourage insects which are known to prey on injurious species, just as we employ dogs, ferrets and cats to prey upon rats and mice.

The introduction of new food plants into a country has sometimes been the cause of insects, otherwise of no economic importance, leaving their natural food, and taking to a new and abundant food source provided by man. An example of this is the well-known Colorado potato beetle, which has caused so much damage to potato crops in America, and was the cause of so much alarm in this country in 1874.

In 1823, when it was first observed, it was a harmless insect, feeding on a wild plant of the potato species (nightshade). On the introduction of the culture of the potato on an extensive scale in America, it transferred its attention to the more abundant and regular supply of food provided by man, and rapidly spread over the whole of North America, and has become an abundant and widely-spread insect pest.

Since insects follow man to suit their own convenience, it is not surprising that we find them in all our habitations, where they find shelter, warmth, and food in plenty. Man himself harbours insects under uncleanly conditions of person.

One of the many trials of the war was the invasion of the louse on men in the line. Their persistence was encouraged by unavoidable overcrowding, and lack of facilities for cleanliness. Apart from the irritation they caused and the consequent loss of sleep, a septic state of the skin was produced, and there was always the risk of the introduction of typhus and recurrent fevers, the virus of which is transmitted by these insects. As it was, a great temporary loss of man power was caused by trench fever, a disease new to active service in the field, and which was definitely proved to be transmitted by the louse and the louse only. It was estimated that at least 50 per cent. of the total sick admissions among troops in the line was primarily due to the presence of vermin. I may state that arrangements have now been made to provide mobile laundries and bathing units for an army in the field, and so in future wars the men, with care, should be kept entirely free from vermin.

Unfortunately, vermin are found not only in an army in the field; they are only too common in our civil population, and it is no credit to our civilisation that infestation by vermin still continues. By the avoidance of overcrowding and the observance of ordinary cleanliness, vermin can be eradicated entirely.

The prevention of injury to prepared foods by insects is of great importance to the Public Health Service, and often presents problems of not only great interest, but of considerable complexity.

In 1912 it was reported to the War Office that large reserve supplies of biscuits in Mediterranean ports and in Ceylon and South Africa, were being destroyed by insects which covered the biscuits with a silky web, and ate them through and through.

In 1913 the War Office requested Mr. Hartley Durrant, of the British Museum, and myself to make an investigation and advise on the best method of prevention.

On investigation, Mr. Hartley Durrant found that the damage was due to two species of moths, the Mediterranean flour moth, *Ephestia 'khuniella*,

and an allied species, the *Corcyra cephalonica*. Both these moths lay their eggs on the biscuits, and the larvæ bore their way into the substance, constantly spinning a web of silk in which eventually they change to the chrysalis state. Intact tins of biscuits taken from stores in England, were also found to be infested with these moths in various stages of their development. This pointed to the fact that the biscuits must have been infested in factories or elsewhere, before they were finally sealed up.

Briefly, we found that the heat developed in the biscuits during baking was sufficient to kill eggs, that might have been deposited in the dough or flour, since the eggs could not survive a temperature of 69° C. for more than twelve minutes, and the degree of heat reached in the biscuits during baking was 125° C.

After baking, biscuits are cooled before packing, and it is during this period that they are most exposed to infestion. Once the egg is laid, packing in tins sealed, however tightly, does not affect the development of the larvæ which can live with very little air, and very little moisture. These moths are very frequently seen in flour mills and biscuit bakeries, unless special precautions are taken, which include fumigation, careful screening of the flour, and attention to the provision of light and cleanliness.

We considered that by introducing a current of screened and cooled air into the cooling chambers, it would be difficult or impossible for moths to deposit their eggs.

Although the investigation was a long and laborious one, the remedy appeared to be fairly simple, and, as a result of this investigation and the adoption of the measures we recommended, there has been no recurrence of the trouble and during the war no loss of biscuits from this cause was ever reported. Had no investigation been made, the consequence of the ravages of these insects would have been a very serious and far-reaching menace to our food supplies in the field.

It is quite possible that the list of insects now known to be responsible for transmitting disease, will eventually, in the light of modern research, be increased, and a closer study of many of our household insect pests would certainly appear desirable.

Illness among native labourers and Europeans in the tropics is an actual cause of disturbance of the labour market, and the outlay for treatment and nursing expenses is also considerable.

The loss of time from productive labour from insect borne disease may be very great, and it has been estimated in the United States of America that the loss of labour by all insect diseases costs the country over 300,000,000 dollars each year.

The injury caused by insects is even more far-reaching than the direct injury they may cause to crops, food, material, and in the transmission of disease. Whole districts may be depopulated owing to the mass attack of insects on food supplies and the destruction of forests and forest products. There are also belts of land in certain countries which otherwise would be a fertile source of crops, where man cannot obtain a foothold owing to the presence of insects which transmit disease.

Measures of Control should aim at protection of the individual against adult insects; destruction of insects and their larvæ, which includes attention directed to their breeding places, and means of sustenance; protection of food and water from contamination by insects and their larvæ.

Individuals can be protected by cleanliness of person and surroundings; careful selection as to habitation; avoidance of overcrowding; and efficient lighting of houses and stores, especially in malarious districts, where mosquitoes abound. The success of personal protection will to some extent depend upon a common sense knowledge of insect life, and a perseverance in the recognised methods of control.

Town planning must include suitable sub-soil drainage, clearance of brushwood, and the avoidance of overcrowding. European habitations should be built on high ground, and as far removed as possible from swamps, refuse heaps, and places where offensive trades are carried on.

Non-immune populations must be protected from insect carriers of disease, and it is therefore necessary to segregate the healthy population in tropical countries, by residence in areas removed from contact with a markedly infected native population.

The use of insecticides and repellants for the personal protection of the individual up to the period of the Great War had not, in this country at any rate, received the attention which it deserved. During the war, demands for repellants against lice, mosquitoes, and sand flies were constant and pressing, and experiments in their use and action had then to be carried out, which necessitated delay, and substances supplied were more often than not disappointing. The result of a trial in many theatres of war left a feeling of doubt as to their practical value, and many of them were very expensive and some difficult to obtain. To sift the problem properly, and to extricate from a mass of substances expected to act as efficient insecticides and repellants, such as can be proved to be reliable and effective under conditions of service in various countries, it would be necessary to institute an experimental station, where the various necessary insects can be bred and maintained, to determine the value and action of insecticides and repellants, not only from a personal, but also from an economic point of view.

A station of this sort could well be modelled on the lines of the experimental stations in several of the States of America.

It should always be remembered that any effort directed towards the general improvement of the sanitation of a community, will tend towards the eradication of insect pests, and that the bed rock of control is efficient sanitation.

The efficient protection of food during manufacture, and on exposure for sale, is greatly neglected both in this country and abroad. Food is exposed to contamination by flies in our shops and on the streets, in our kitchens and stores, with little attempt at protection.

In America, Canada and Australia regulations are in force to prevent the contamination of food by exposure, and no food is allowed to be exposed for sale unless screened by glass or gauze. In our own houses the protection of food is a simple matter. The provision of screened meat safes, the screening of our store rooms and kitchens, and the use of gauze coverings for cooked food set aside, such as those now sold as "fly foilers," is not an expensive matter, and should never be neglected.

To prevent the ravages of insects in food stores and mills, and places of manufacture, attention must be paid to general cleanliness, the avoidance of accumulated dirt and refuse, the efficient lighting of the premises, the provision of good ventilation, and general screening of windows and doors. A current of cooled air is effective against moths, and periodic fumigation of premises which are not of modern construction is generally called for.

Those of us who have read the inspiring works of the late Jean Fabre cannot but help seeing that a study of living entomology can be attended, not only with absorbing interest, but also with ultimate benefit to ourselves, in furnishing general psychology with data of inestimable value.

The Slaughtering of Animals for Human Consumption.*

Lecture by Dr. W. J. Howarth.

Dr. Howarth delivered the Benjamin Ward Richardson Memorial Lecture at the Barnes Hall, on November 20th, on the Slaughtering of Animals for Human Consumption. Dealing with the subject of the new meat regulations, Dr. Howarth showed that, without concentration, only a portion of the meat consumed by the public could possibly be submitted to official inspection. The safeguard that the butchers must notify local authorities of abnormalities was inadequate, for the reasons that the prior attention necessary to be given to these inspections would result in a reduction of other carcases being examined during rush hours (since slaughterers were only required to retain what they considered sound meat for a few hours after slaughtering) and that the recognition of abnormalities was not within the ability of the average trader. As proof of this, he showed that at Smithfield Market in 1925, where the wholesalers are mostly competent men, and where a large staff of inspectors is regularly employed and where, as a consequence, country traders only send carcases which *they consider* are fit for human consumption, no fewer than 351 carcases of pork and 931 diseased heads from other pork carcases were condemned as well as 284 mutton carcases.

Dr. Howarth also showed that it was not possible for the purchaser to distinguish between inspected and uninspected meat and he expressed the strong opinion that the public should demand that inspected meat should bear the mark of inspection. This was done on the fore-quarters of Kosher meat intended for Jewish consumption, but, as the hind-quarters were not consumed by Jews, they were not marked, and thus the purchaser could not distinguish in the general mix-up which were quarters from extremely satisfactory Kosher carcases and which from uninspected animals.

He also observed that the retailer objected to "marking" because his customers thought meat so distinguished was colonial produce, but he expressed seriously the opinion that unless some improvement in the home inspection resulted, instead of home traders demanding that the colonial produce should be marked so that it could not be marketed as home-killed, the importer might reverse the position and demand that his reasonably well-inspected product should be protected against the substitution of inferior and uninspected home produce.

Dealing with the question of cruelty, Dr. Howarth mentioned observations made by his colleagues, Mr. Hayhurst, Lt.-Col. Young and himself on the use of a mechanically-operated instrument. It was shown that animals rendered unconscious by this method bled well, that the flesh was not impaired, that only minor and negligible damage to the carcase resulted, that little time was lost, and that certainty of action was undoubted. A record of 1,259 shots was kept, and these sufficed to render unconscious 1,255 animals of different varieties. Against this total it was shown that extending over nearly 1,000 observations, 100 bulls required 250 blows with the pole-axe to produce unconsciousness, the same number of oxen 123; cows 127; and pigs 155.

Dr. Howarth thought that the time had arrived when the use of a suitable mechanical instrument should be made compulsory in substitution for the pole-axe, and also to produce unconsciousness preliminary to the slaughter of even the smaller animals.

* Fourth Benjamin Ward Richardson Memorial Lecture, 1925, held under the auspices of The Model Abattoir Society.

Army Veterinary Service.

London Gazette. War Office. Regular Forces.

January 1st.—Colonel A. G. Todd, C.B.E., D.S.O., relinquishes the appt. of Comdt. R.A.V.C. School (Dec 1st, 1925).

Memoranda.

January 5th.—The following Major to be Bt.-Lieut.-Colonel (Jan. 1st): W. E. Schofield, O.B.E., R.A.V.C.

Territorial Army.

January 1st.—Major J. Adamson, M.C., T.D., vacates appt. of D.A.D.V.S. of a Division (January 1st); Major J. F. Rankin, T.D., is apptd. D.A.D.V.S. of a Division (January 1st); Capt. C. Nicholson resigns his commn. and retains his rank (January 2nd).

In the past eight years the Canadian National Research Council has expended $119,000 (£23,000) in bursaries, studentships, and Fellowships to graduates of Canadian universities and technical colleges. Of the 103 grantees who completed training only fifteen accepted positions in foreign countries. All the rest are in the Dominion save six, who are continuing post-graduate studies in the United States or England.

The Veterinary Record.
9th January, 1926.

DISEASES OF THE SMALLER ECONOMIC ANIMALS.

With the decline of demand for services in one direction the profession should create a demand in another sphere. Scattered all over the country, and especially near towns, poultry farms for the production of eggs and table fowls and rabbitries for pelts and wool are found. Large sums of money are often invested in them, and when taken in the aggregate they run into several millions and exceed, in this country, the amount invested in the wheat industry. To show that the poultry industry is not pushed to its utmost we have only to point out that during 1924 we paid out £20,000,000 for imported poultry and eggs most, if not all, of which we should have produced ourselves. The reason why this industry is not larger than it is is the fact that our losses from disease, especially during the earlier life of the bird, are enormous. Taking the earlier months of the past year, the losses from bacillary white diarrhœa, brooder pneumonia, and coccidiosis only must have exceeded £1,000,000. It was no uncommon incident for a rearer to lose 500 or 600 chickens out of 600 or 700. This loss was very great to the owner, but it was a very much greater loss in table fowls and eggs to the community.

Unless the losses from these diseases of young chickens and those contagious and dietetic diseases of adult poultry can be checked or controlled by efficient veterinary services, the industry, great as it is now, cannot make headway against the enormous supply of eggs and poultry from abroad. By the proper inspection of markets, shops, shows and of places where disease is actually known to exist (such as in hutcheries or on farms) a great deal may be done to lessen its incidence or spread. Added to this, official inspection of live poultry would check, to some extent, the introduction of disease from abroad.

There seems no reason why a poultry farmer or rabbit breeder or a rearer should not employ privately a veterinary practitioner provided, of course, he possessed adequate knowledge to advise him how to prevent or eliminate disease from his stock, which, from an economic point of view, is often valuable.

But we may ask ourselves how many of the rank and file are there who are sufficiently equipped to undertake such duties? Poultry and rabbit raising, as now generally carried out, is of great national importance, and forms a part of the wealth of the community, and it is for the veterinary profession to assist in conserving that wealth by the prevention of disease among those animals forming that wealth.

At present there is the necessity for the demand, but no supply to that necessity. If there be no actual demand the profession should create it.

CLINICAL AND CASE REPORTS.

An Interesting Monstrosity.

By John L. Taylor, M.R.C.V.S., Coatbridge.

A short time ago I was requested to attend an Ayrshire cow at calving. On examining the cow, I found I had to deal with a monster fœtus (the first in my experience) with two heads and two legs. The owner of the cow, prior to sending for me, had worked all night at his animal trying to relieve her.

He had used a good deal of traction, because I found the calf jammed tight in the pelvic cavity—it could be moved neither backwards nor forwards.

After failing to make any impression on the position of things, I thought of embryotomy, but owing to the want of operating space this was out of the question.

The cow was now in a very weak condition, and the labour pains were almost *nil*, so I advised the owner to have the cow removed to the slaughterhouse, so that the carcass at least, might be saved.

On post-mortem, I removed the dead fœtus from the uterus and had it photographed. I enclose two photographs of the calf in different positions, in the hope that they may be of interest to some of your readers.

The calf possesses two complete heads and two necks which unite at the posterior part of a single pair of shoulder blades. The calf was otherwise normal.

Fatal Lingual Injury to a Horse.

By E. Alfred West, F.R.C.V.S., London.

The following is a case presenting puzzling features as to causation and treatment :—

A horse was found before an emptied manger with its tongue protruding to its fullest extent, the visible portion being extremely enlarged and hard, though the posterior part appeared normal. There were no marks of a struggle or fall, and evidence of injury was confined, except for the abnormal aspect and position of the tongue, to a flattened sublingual and ante-laryngeal swelling. The animal was totally unable to eat or drink.

An incision, about four inches long and one inch deep, was made on each side of the tongue, about five inches from the tip, which was also incised in several places, but no blood issued. Continued application of warm fomentations and massage caused about a small teacupful of dark-coloured blood to ooze away. Next morning the condition of the tongue was unchanged, except that it showed evidence of gangrene.

The horse was destroyed, and *post-mortem* examination revealed deep bruising of the parts in front of the larynx, which contained a long, thick rope of clotted blood.

Observations of practitioners upon this case will be welcomed.

Blood-Pressure and Its Application in Canine Practice.*

(J. G. Horning and A. J. McKee, in *Journal A. V. M. A.*, November, 1925).

So many requests have been made for a more simplified article on blood-pressure work, that we decided to write a supplement to the article already published in *Veterinary Medicine* and, in this, answer the numerous questions that have been asked us about this work. For those who do not have their old file to refer to, we will first give a short résumé of the first article.

Instrumentation.—The most accurate instrument is the mercury type, the writers preferring the Baumanometer, used in conjunction with the special sleeve devised by one of us (J. G. H.), and the handiest for carrying with you on calls is the aneroid type, of which there are several good makes on the market. In our work we use the Baumanometer for hospital work and the aneroid type for work at the home. We make a test of our aneroid instrument every day. To ensure accuracy, this can be done with a rubber Y-collector, allowing the attachment of aneroid and Baumanometer.

Technique.—The dog should be placed on his right side, on a table or the floor, and the cuff applied at the highest point possible on the left hind leg, special care being taken in tightening the straps of the cuff to see that equal pressure is applied over the area covered by the cuff. By having an attendant or the owner hold the dog in the recumbent position, the bulb and dial are held by an assistant, while the leg is grasped by the operator and the femoral artery palpated, between the stifle and hock, with the right hand, while the artery is palpated on the foot with the left hand. As soon as the pulsation is detected, at a nod of the head the assistant exerts a steady pressure on the bulb, inflating the cuff with air until the operator is no longer able to get a pulsation. He then makes his reading at the point where the column of mercury or the hand on the dial rests. This gives him the systolic pressure, when, at another nod, the assistant releases the air slowly and evenly. As soon as the operator again feels the pulsation he notes the position on the column or dial and this gives him his diastolic pressure. Then the entire amount of air is released from the cuff and it is removed.

Blood-pressure being individual and influenced by inherent physical characteristics, several readings under as nearly like conditions as possible are desirable when determining true normal, which is of the greatest value in diagnosis. The following is a table of averages based upon a series of observations to determine the normal blood-pressure of dogs :

Weight	Systolic	Diastolic
5-15 lbs.	105	73
15-30 lbs.	110	77
30-40 lbs.	112	78
40-50 lbs.	113	79
50-60 lbs.	120	84
60-70 lbs.	124	86
70-80 lbs.	126	88
80-90 lbs.	130	91
90 lbs. up	136	95

Hypertension is an abnormal rise in blood-pressure, and is noted in pneumonia, distemper, bronchitis, nephritis, meningitis, asthma, toxæmia, lead and arsenic poisoning, constipation, tympanites, cecitis, eclampsia, spirochetosis, ictero-hæmorrhagica and hydrophobia. Hypotension is an abnormal decrease in blood-pressure, noted in filariasis, ascites, different types of paralysis, hæmorrhage, rachitis, yellow jaundice, valvular insufficiency, later stages of hookworm infestation, later stages of ptomaine poisoning, and later stages of all febrile diseases.

What are the relations of the systolic and diastolic pressures from a diagnostic standpoint ? The systolic pressure means nothing from a diagnostic standpoint, as it is subject to too much variation. The least bit of excitement, a too-full stomach, violent exercise, or any slight nervous disorder may cause the systolic reading to be very high. It reflects the strain to which the arteries are subjected, but the diastolic pressure indicates the real work the heart has to do, and is valuable in determining whether organic, vascular or cardiac changes are present, as this pressure is more constant and is not so easily disturbed. In our work we go mostly on the diastolic readings, as all dogs, when first brought into the operating room, usually run a high systolic pressure.

Functional rather than structural changes form the basis of modern diagnosis, because dogs, like machines,

*Presented at the fifteenth annual meeting of the Texas State Veterinary Medical Association, College Station, Texas, June 15-20, 1925.

show mechanical impairment before the break-down. Blood-pressure is the foremost functional symptom. It is often the silent guide to impending attack. We have had cases examined where the temperature would be normal, respiration normal, pulse normal, but showing an abnormal diastolic pressure. We were thus able to forecast an impending attack and, in receiving hospital cases, place the dog in the observation ward for checking up, so that in case of an infection he could then be kept from the possible infection of other cases. Our prognosis in these cases is more guarded and, being posted as to some danger, we are on the lookout and can institute earlier treatment.

PRECAUTIONS TO BE OBSERVED.

When possible, readings should be made about the same time of day and in the same relation to meals. However, by thoroughly questioning the client in regard to the patient, allowance can always be made for over-exercise, full stomach and any nervousness. Give instructions to the client for the preparation of the patient by the time of the next reading, if examined at the house; or properly time the examination, if at the hospital. If one would remember to pay but slight attention to the systolic and concentrate on the diastolic pressure, chance for error is very slight.

In the bitch, during the period of œstrum, it is well to bear in mind that the blood-pressure frequently rises a day or two preceding this condition, and is lowest during the sixth day. In spayed bitches there is an increased blood-pressure, as much as 15 mm. above normal, for a normal bitch of the same size. This is reversed in dogs that have been castrated, although we have never found the diastolic pressure lower than 10 mm., in comparison with a normal dog of the same size. In pregnancy, where the blood-pressure is higher than normal but unaccompanied by albuminuria, we resort to free purging, which usually restores it to normal. In old dogs, where a high diastolic pressure is noted, if the patient is not watched, there will be signs of eclampsia.

The length of time it will take to master the technique, of course, depends upon the operator. We would suggest that the operator get a dog that is not nervous and practice on this dog until it becomes easy for him, and he finds, in checking up on his readings, that they are somewhat constant. One afternoon's work should give him enough confidence to institute regular readings on the patients he has to examine.

Age has its effect on blood-pressure, but it is not so noticeable in dogs as in human beings. In the majority of cases, in old dogs, it varies from 5 to 10 mm. higher than the normal pressure given, unless the dog is extremely old, when the reverse is noticed. The operator, in this case, has to take into consideration the general appearance of the patient. In pups we have been limited in our examinations on account of the size of our cuffs, having had to confine the readings made to pups of the larger breeds, but there was a higher pressure noted in pups six weeks to three months old than the normal readings on dogs of the same weight but more matured.

REPORTS.

Fifteenth Report of the Development Commissioners, for the year ended 31st March, 1925.

In reviewing the Report of the Development Commissioners for the year ended 31st March, 1925, a new departure has been made from previous years. Comparison has been made of expenditure in respect to animal husbandry with that allocated for crop production, and, again, animal husbandry has been subdivided into (*a*) Grants applied to animal nutrition, breeding, etc., or what might be termed the health side of animal husbandry, and (*b*) Grants in respect to disease of animals, the latter being of more particular interest to the veterinary profession. The table given will show at a glance how, under these headings, monies have been allotted by the Commissioners. In certain of our dependencies, and possibly at times even in our own country, more thought has been directed towards crop production than towards the animal husbandry side of agriculture, the latter being somewhat starved in comparison with the former. However, it is satisfactory to observe from the accompanying table that it is not so in the Commissioners' operations of the year under review. Grants are well proportioned, and are uniformly fair between the groups mentioned. It should be noted also that in the first group horticulture is included in agriculture, and that a considerable item of expenditure relates to plant disease, research into which is increasingly important, and rightly should run parallel with research into animal disease.

As explained in previous reviews, the money at the disposal of the Development Commission falls under two categories, *viz.*, (*a*) That from the "Old" or Ordinary Fund set up by the Development and Roads Improvements Acts of 1909 and 1910 for the development of agriculture, rural economy and fisheries, and to which a sum of approximately £200,000 is voted annually; and (*b*) the New or Special Fund provided by Section 3 of the Corn Production Acts (Repeal) Act, 1921, amounting then to £850,000 for England and Wales (separate allotment of £150,000 for Scotland) and standing at £661,399 on 1st April, 1924. After payments during the financial year 1924-25, the balance of the two funds on the 31st March, 1925, remained at £224,572 and £537,480 respectively. The latter fund was calculated originally to last until March, 1927.

Dealing with expenditure directed towards diseases of animals, or the purely veterinary side of expenditure, it is gratifying to note the sympathetic consideration and assistance rendered by the Commissioners. In addition to the capital grant of £19,000 for the provision of land, field laboratories and equipment in connection with the Institute of Animal Pathology, Cambridge University (as part of the original scheme) grants for salaries, wages, and maintenance up to a total of £10,000 were recommended to the Ministry. Grants up to £4,450 for working expenses and staff were approved for the recently-built and opened

Grants by the Development Commissioners

Agriculture and Horticulture. (Crops, Soils, Manures, etc.)

	£
Rothampstead Experimental Station	25,650
University of Aberdeen, College of Agriculture	1,165
Research Institute of Plant Physiology, I.C.S. and T.	5,750
Plant Breeding Institute, Cambridge University	4,860
Welch Plant Breeding Institute, Aberystwyth...	6,500
Scottish Society for Plant Breeding	1,100
National Institute of Agricultural Botany, Cambridge	3,500
Long Ashton Agricultural and Horticultural Research Station	12,000
Chipping Camden Sub Station, Fruit Pres. ...	4,000
Horticulture Research Station, E. Malling ...	6,700
Experimental and Research Station, Cheshunt	2,700
Horticulture Research Station, Cambridge University	1,390
Ditto Soil Survey	700
Silver Leaf Investigation Station, Cambridge University	1,550
Fruit Testing Station, Wisley	795
Agricultural Economics' Research Institute, Oxford University	4,000
Ditto Ditto, ...	5,900
Institute Agriculture Engineering, Oxford University	8,000
Advisory Service (approx.)	48,000
Special Research—$\frac{1}{20}$ of £4,000	2,800
Research Scholarships (6) at £100	600
Scholarship for Agricultural Teachers (5) ...	500
Travelling Fellowships	590
Scholarships for Agricultural Workers (extra) ...	2,800
School of Agriculture, Cambridge	21,500
Swanley Horticultural College	5,000
Seale Hayne Agricultural College	2,500
Farm Institute, Usk	20,000
Farm Institute, Pibwilwyd	11,000
Norfolk Agricultural Station	800
New System of Farm Management	750
Variety Tests of Farm Crops	2,250
Marketing Agricultural Products	6,800
Fruit Grading, Cottenham	630
Testing Agricultural Machinery	1,000
Lactose Factory, Crewe...	7,243
New Process Sugar from Beet	600
Training Centre for unemployed youths ...	500
Young Farmers' Clubs	900
Royal Agricultural College, Cirencester... ...	2,000
Potato Pedigree Experiment, Scotland ...	600
	£235,623

Animal

Animal Nutrition, Breeding, Dairying.

	£
Animal Breeding Research Station, Edinburgh University	2,650
Animal Nutrition Institute, Cambridge University	12,228
Rowett Institute, Aberdeen University ...	15,000
Ditto Ditto, for Stock Farm ...	8,000
National Institute for Dairying, Reading ...	11,300
Ditto Endowment...	5,000
National Poultry Institute	3,700
Advisory Service (approx.)	3,500
Special Research Grants, $\frac{1}{20}$ of £4,000	800
Research Scholarships, 3 at £100	300
Improvement Live Stock (bulls, boars, sheep, milk recording)	6,705
Ditto	10,475
Heavy Horse Breeding	7,500
Goats	525
Experiments, Pig Industry {S. E. College, Wye / Harper Adams}	6,478
Harper Adams Agricultural College, Dairy Farming	271
Dairy Bacteriology, Cambridge and Bristol University and S.E. Agricultural College ...	637
Agricultural Economics, Milk production from arable land	1,000
	£96,069

Totals :—	£	
Agriculture and Horticulture	235,623*	*Includes Contingencies and Bonuses of £3,540 under Advisory Scheme.
Animal Husbandry	169,669*	
Rural Economy	31,945	
	£437,237*	

Commissions Schedule—£434,207 (not including Contingencies and Bonuses of £3,540 under Advisory Scheme).

for the year ended 31st March, 1925.

HUSBANDRY.

Diseases of Animals.

	£
Institute of Animal Pathology, Cambridge ...	10,000
Ditto extra ...	250
Ditto (capital grant)	19,000
Research Institute Animal Pathology, R.V.C. Lond.	4,450
Scottish Animal Diseases Research Association	2,300
Institute Agricultural Parasitology School of Hygiene and Tropical Medicine, London ...	4,600
Research into Foot-and-Mouth Disease ...	15,000
Advisory Service (approx.)	2,500
Special Research Grants $\frac{2}{3}$% of £4,000	400
Research Scholarships, 1 at £100	100
Research in Veterinary Science, Liverpool University	15,000
	£73,600

RURAL ECONOMY.

	£
Rural Industries Bureau	3,530
National Federation of Women's Industries ...	3,050
Village Clubs Association	850
National Council of Social Service	5,000
Kent County Agricultural Committee	150
Blacksmith's Van	550
Studentship Rural Craftsmanship	450
Scottish Agricultural Organisation Society ...	5,865
Hereford Rural Electricity Scheme, £2,500 annually for five years	12,500
	£31,945

ADVISORY SERVICE.

	£
England and Wales	43,097
Contingencies and Bonuses	3,540
Scotland	7,732
	54,369

AGRICULTURE AND HORTICULTURE.	ANIMAL PRODUCTS.	DISEASES OF ANIMALS.
Mycological Entomological Soil Survey Economics (£12,000).	Dairying— Small Sums Milk Competition. Out of £3,750, Bristol University (£200). Out of £4,992, S.E. Agric. College (£187). Greater part of £2,501, Glasgow Agric. Coll.	3 Veterinary Officers.
approx. £48,000	approx. £3,500	approx. £2,500

Research Institute in Animal Pathology, Royal Veterinary College, London. An annual grant of £2,300 has been extended to the Animal Diseases Research Association, Scotland. A grant of £15,000, on a £ for £ basis, has been recommended for Liverpool University for the provision of buildings for Teaching and Research in Veterinary Science, on the understanding that the university should provide a site free of cost and that a detailed scheme, with plans, estimates and specifications, should be submitted for the approval of the Ministry and the Commissioners; also that the new buildings (the total cost of which is estimated at £40,000) should not be sold or diverted to any other use without the consent of the Ministry and the Commissioners.

With a university benefaction of £20,000 towards the endowment of a new professorship, the Veterinary School at Liverpool (which is an integral part of the university) has now been removed from anxiety and placed on a better plane for the instruction of its students, drawn more especially from Welsh districts. A further grant of £15,000 has been sanctioned for the pursuit of foot-and-mouth disease investigations, and the power of the new Institutes of Animal Pathology at Cambridge and London, the Ministry's Veterinary Laboratory, the Scottish Animal Diseases Research Association, the Lister Institute, and the National Institute of Medical Research is to be brought to bear on the difficult but important problems of this disease. The sum of £4,600 has been granted to the Institute of Agricultural Parasitology at the London School of Hygiene and Tropical Medicine towards helminth investigations, and it is interesting to note that the function of the institute, though primarily relating to parasitic worms in association with disease in animals, now includes helminth diseases of plants.

Of the work achieved and in progress at the new Veterinary Research Institutes, it must be remembered that they have not yet had time to get into full working swing; nevertheless, from the short resumé of work given in the text of the report, good progress is being made. At the Cambridge Institute of Animal Pathology the modified tuberculin test and the potency test for tuberculin stand out clearly as highly creditable. The preparation of a hyper-immune serum for the treatment of swine erysipelas has been completed, and has been proved successful in preventing spread. Experimental work has shown that a sound immunity can be produced in cattle and sheep against *B. chauvoei* and *Vibrion septique*. The causal organism in abortion in ewes has been determined and field experiments for prevention are in progress. The cause of "joint-ill" in lambs is being closely studied, and prolonged attention is being devoted to the cultivation of ultra-microscopic organisms, including the virus of foot-and-mouth disease. Inadequate accommodation hampered the work at the Research Institute in London, which was not ready for occupation by the end of March. Experimental treatment in Johnë's disease was undertaken and advice in prevention given. Blood tests of mares affected with, or suspected of, contagious abortion were conducted and advice to owners given. Preventive experiments against quarter-ill in cattle were continued, and minor investigations related to coccidiosis and parasitic worms. The new Institute of the Scottish Animal Diseases Research Association at Liberton, near Edinburgh, was begun during the year, and it is expected to be ready for occupation early in 1926. Attention was given chiefly to braxy, scrapie, lamb dysentery, trembling, and mammitis in sheep, grass sickness in horses and mammitis in cows. Field experiments in preventive inoculation against braxy have been carried out extensively in twenty-three counties in Scotland, six in England and three in Northern Ireland. In lamb dysentery further work has confirmed the view that infection remains from year to year in the soil of the infected farms, and that the disease spreads from farm to farm by the movements of stock during the lambing season when deaths are occurring or shortly after. In scrapie, evidence seems to be accumulating to show that the disease is transmitted from tainted stock to healthy by coition only.

To recite much of the interesting activities in other fields, and the special work of other workers, would occupy much space, and review has therefore been confined to the veterinary field. A few remarks may be made, however, about the Advisory Service set up by the Commission.

A reference to the table might lead a casual observer, at first sight, to think that the amount recommended for this service is not only very considerable, but that the grants (which are quoted approximately) as between crop production on the one hand, and animal husbandry on the other, are disproportionate. This, on reflection, is not so, for it must be remembered —and it may be taken as thoroughly appreciated and acknowledged—that the real adviser in respect to animals in their health and in their sickness is the veterinary practitioner, and collectively the veterinary profession, which stands for that purpose. On the other hand, for the ills of crop production and plant life generally the mycologist, the entomologist, the chemist, and even the expert economist are wisely thought of and rightly placed; indeed, it may be taken as true that much more yet has to be learned with regard to plant and soil diseases and disabilities, and money spent in research to that end will reap an abundant reward.

We should like to join in the general appreciation of the great work which the Development Commission has undertaken, and in the desire to see the fullest success resulting from their recommendations. It goes without saying that the facilities which the Commissioners and the Ministry place in the way of research and education cannot fail to be of the greatest benefit to workers individually, and to scientific effort generally, in the many complex problems which baffle the skill of the investigator. Review would also not be complete without an acknowledgement of praise and thanks to those charged with the editing of the Report. Covering so wide a field of

service, it is yet concise, and full of valuable and instructive information. We recommend it to our readers. Copies can be obtained from His Majesty's Stationery Offices at Adastral House, Kingsway, London W.C.2; York Street, Manchester; 120 George Street, Edinburgh; 15 Donegall Square, W. Belfast. Price 3s. 6d.

J. M.

The Intelligence Department of the Ministry.*

A report has just been published giving in a concise form an account of the Ministry of Agriculture and Fisheries' activities during the three years 1921-24 in the important fields of agricultural education and research, including work in connection with milk and dairy produce, poultry, horticulture, and the improvement of live stock. It continues a similar report for the years 1919-21, which described the policy adopted by the Ministry with regard to agricultural education and research during the years immediately following the close of the war; the present report† shows the development of that policy during the last three years. The provision of the Corn Repeal Fund of £850,000 has enabled very substantial progress to be made, particularly in the extension and equipment of Research Institutes, University Departments of Agriculture and Agricultural Colleges, and County Farm Institutes.

Organisation.—The general organisation falls roughly into three divisions: (1) research work; (2) the provision of technical advice; and (3) education. The Research Institutes and stations, 19 in number, are grouped according to the subject of investigation, and are associated (wherever possible) with a University. Advice on farming problems is usually given through the County Agricultural Organiser and his staff, who come into direct contact with the farmer, but (to quote from the report):—

> "They give advice on matters of everyday routine; they are, so to speak, the 'general practitioners' for agricultural ills. But where they cannot diagnose these ills or prescribe the treatment, or where they wish to fortify themselves with the opinion of those who make the class of illness in question their life study, they can call in the specialist officers."

These specialist officers are called Advisory Officers, and are located at "advisory centres" (usually a University Department of Agriculture or an Agricultural College) to which are attached a group of counties forming a "provincial area." The Advisory Officers (chemists, entomologists, mycologists, economists, bacteriologists, and advisers in veterinary science) also form a link between the general body of research workers and the county staffs in their province.

The third division, the teaching of agriculture, falls naturally into two sub-divisions: (1) the higher education provided at University Departments of Agriculture and Agricultural Colleges, usually two- or three-year courses leading to a diploma or degree, and (2) the systems of agricultural education maintained by local authorities. The educational work carried out by the latter covers a wide field, and ranges from courses of one year and under at Farm Institutes (there are now 16 Institutes in operation) down to single lectures on special subjects. The counties also conduct experiments and demonstrations, organise and assist shows, promote clean-milk competitions, furnish advice on rationing, etc., and the majority provide scholarships for courses at Farm Institutes and Colleges. Finally, the whole organisation is co-ordinated:

> "Apart from voluntary organisations, such as the Agricultural Education Association, there is first the unifying influence of the Ministry which, through the power of the purse, can supervise the whole system. Secondly, there is an organisation of Councils or Committees, of which the Research Council (which includes all the Directors of Research Institutes) may be taken as a specimen, or the Animal Diseases Research Committee, or the Committee of Advisory Economists. Thirdly, there are periodical conferences not only of Advisory Officers from all over the country, but also 'Provincial Conferences' between the specialist Advisers at an Advisory Centre and the Organisers of the Counties in the Province served by that Centre. Last, and not least in importance, there is a development of the last two years: a conference of Organisers held at a Research Institute, so that County Officers may meet the workers of that Institute and discuss some particular subject of common interest."

Thus the chain is complete. On the one hand, the farmer can command, through the agency of the Agricultural Organiser, next the Advisory Centre, and then if necessary the Research Institutes, the resources of the whole field of agricultural science in helping to solve any particular farming problem with which he may be faced. On the other hand, results of practical importance obtained at a Research Institute are tested out on the experimental and demonstration plots conducted by the college and county staffs, and, subject to any modification suggested by local trials, are brought before the farmer by means of visits, lectures, classes, courses at Agricultural Institutes, publications, etc.:

> "It is clear, however, that neither books nor pamphlets nor even lectures will reach the mass of the farming community. The Ministry is bound to repeat that, broadly speaking, the County Agricultural Organisers, with the specialist Advisory Officers as their consultants, must do the main work of instructing and guiding the practical farmer. They are the channel by which the stream of knowledge can most surely and easily flow to its destination."

One further extract from this section of the report may be quoted:—

> "The whole organisation described above is young, at least in its present development; before and during the war large parts of it scarcely existed, and other parts were comparatively weak and unsupported. There is still room for much improvement. But it may fairly be said that the main lines of the organisation are firmly traced and the outlines largely filled up; and that the chief requirement now is time for it to settle harmoniously to its work, and to win the closer knowledge and full confidence of the farming community."

* Report on the Work of the Intelligence Department of the Ministry for the three years, 1921-24: H.M. Stationery Office, 163 pp., 5s. net. To be obtained through any bookseller, or directly from the Stationery Office at the following addresses:—Adastral House, Kingsway, London, W.C.2; 28 Abingdon Street, London, S.W.1; York Street, Manchester; 1 St. Andrew's Crescent, Cardiff; or 120 George Street, Edinburgh.

† Reprinted from the *Journal of the Ministry of Agriculture and Fisheries*, December, 1925.

Research Institutes.—Each of the three main divisions is described in detail in the report. As stated above, the Research Institutes are grouped according to the subject of investigation. There are thus five Institutes which deal with soils and crops; five with horticulture; four with animal pathology; three with animal husbandry; one with agricultural economics; and one with agricultural engineering. The work of each Institute is explained in the report: it will be sufficient here to state that during the period under review two important gaps in the system have been filled. The Institute of Agricultural Engineering was established at Oxford in association with the School of Rural Economy, and a new Institute in Animal Pathology was founded at Cambridge. Important extensions and improvements have been carried out practically at all the Institutes, with the aid of capital grants from the Ministry totalling £198,000.

The Advisory Service.—Much interesting information is given in the section dealing with the advisory service, the second of the main divisions. For the purposes of this system, the country has been divided into 14 provinces, each with its Advisory Centre, which, in turn, has its staff of Advisory Officers. Most centres have chemists, entomologists, mycologists, economists and dairy bacteriologists. Veterinary advisers are recent appointments, and are not yet generally established. As regards the duties of Advisory Officers, the chemist gives advice and carries out experiments on soils, manures, feeding stuffs, spraying materials, etc., and in those centres where there is no dairy bacteriologist sometimes also does the bacterial counts in connection with clean milk competitions. The entomologist, who keeps in close touch with the Ministry's pathological laboratory at Harpenden, gives advice and carries out local investigations on plant diseases caused by insects: these officers deal, in the aggregate, with from 3,500 to 4,000 inquiries annually. The mycologist advises on plant diseases caused by fungi and bacteria. The economist provides advice on agricultural economic questions in general, and in particular on questions of book-keeping and accounts, costs of production and farm management. The veterinary officers, besides advising farmers on veterinary problems, carry out local investigations, ascertain the character of the diseases most prevalent in their province and the veterinary matters to which farmers attach most importance. The dairy bacteriologists are, for the most part, employed in carrying out the bacterial counts of milk samples, and as a result of this work advising farmers on methods of clean milk production.

It will thus be seen that the County Agricultural Organiser has, at his call, expert advice on most of the problems which beset the farming community. The grants paid by the Ministry in aid of the work of advisory centres totalled £72,680 during the three years covered by the report.

It is of interest to state at this stage that by means of special research grants investigations are carried out at Research Institutes outside the normal programme of work, or conducted elsewhere than at the Research Institutes. A list of these investigations is given in the report. In order to provide recruits for Research Institutes and Advisory Centres, a small number of research scholarships is awarded annually by the Ministry. A few travelling fellowships are also awarded to existing workers to enable them to familiarise themselves with work abroad.

Education.—Turning now to the important subject of agricultural education, the report records that on the Ministry's grant list there are 15 colleges (9 Agricultural Departments of Universities and 6 Agricultural Colleges) where instruction in higher agricultural education is provided. The annual maintenance grants paid by the Ministry to these colleges amount to £48,500. With the aid of capital grants (usually on a £ for £ basis) from the Ministry, extensive improvements have been made at most of the institutions. The Royal Agricultural College, Cirencester, the oldest college in England and Wales, which was closed during the war, was re-conditioned with the aid of a grant of £15,000 and was re-opened in 1922. The University College of Wales, Aberystwyth, also received a grant of £15,000 in aid of the erection and equipment of new buildings for the Agricultural Department. The Ministry contributed a grant of £7,000 towards the purchase of the freehold of two farms for the School of Agriculture, Cambridge University. Harper Adams Agricultural College, the University of Reading, Seale-Hayne Agricultural College and the Swanley Horticultural College for Women, also received substantial grants in aid of building work. Grants of £15,000 each have been promised in aid of the new buildings which are being erected for the Agricultural Departments of Leeds University and University College of North Wales, Bangor.

With the gradual passing of the post-war conditions the colleges are returning to a normal footing, and the attendance, on the whole, is well maintained. In the spring of 1924 a census was taken of the future intentions of students who were then attending courses:

> "The figures did not bear out the impression which is generally held, that only a small proportion of the students at Agricultural Colleges, etc., intend to become practical farmers. Some 59 per cent. of the students had practical farming as their objective, while another 19 per cent. contemplated posts connected with farming, such as estate management. The proportion of students having official posts in mind was less than was expected, being under 20 per cent."

Considerable progress has been made in the county systems of agricultural education. It would be impossible within the scope of this article to enumerate all the developments—reference must be made to the report itself—but the following summary may give some indication of the work that is being done. Other activities of local authorities in connection with milk and dairy work, small livestock and horticulture, are referred to in the sections of the report dealing with those subjects.

When the previous report was published, 13 Farm Institutes were in being, 7 of which had only just commenced; there are now 16 in operation and another is approaching completion. In addition, considerable improvements have been made to most of the others with the aid of capital grants from the Ministry. During the three years 1921-24, the number of students attending courses at Farm Institutes was 1,939; over 10,000 attended organised day courses; 1,800 attended evening classes; and 2,500 received instruction in manual processes. The number of lectures, demonstrations, and other meetings held during the period was upwards of 23,000. The total number of scholarships awarded by county councils for

agricultural courses was 2,871, representing a value of over £39,000.

The scholarships scheme for the sons and daughters of agricultural workmen and others was established in 1922. Benefits under this scheme are confined to the children of agricultural workmen, and of other countryside workers in a similar economic position, and to young persons who are themselves bona-fide wage earners in the agricultural industry. The awards range from three or four years at a University Department of Agriculture down to short courses at Farm Institutes, and are of sufficient value to enable the recipients to pass through the courses without cost to their parents. During the three years, 350 scholarships have been awarded, and an interesting table shows the distribution of the scholarships among the various sections of the rural community. Another table gives particulars of the subsequent progress of a number of scholarship-holders who completed courses at Farm Institutes, from which it is satisfactory to note that the great majority returned to farm work. The report states:

"Consideration of the applications brought to light many cases of people who, by sheer grit and determination, had managed to improve their education though severely handicapped by lack of means; . . . It is perhaps too early to draw conclusions about the scheme as a whole. From reports on the work and conduct of the scholarship-holders which the Ministry receives from time to time, it is clear that, with exceedingly few exceptions, the scholars are proving themselves capable students, well worthy of the assistance they are receiving, and that some are doing exceptionally well."

Another scholarship scheme initiated by the Ministry during the period provides for the award of scholarships to students who intend to become agricultural organisers, or teachers or lecturers in agriculture. The object of these scholarships, which are for the period of two years, is to broaden the knowledge and experience of the students and to give them an insight into the economic position of agriculture, both at home and abroad. The first awards under this scheme were made in 1924.

A short account is given of the schemes for the training of ex-service officers and men in agriculture. With the exception of the training of disabled ex-officers under the Royal Pensions Warrant, these schemes have now been closed, and some interesting information is given on the results of training in the case of officers granted scholarships or training grants.

Dairying.—The section dealing with milk and dairy work should prove of much interest to all who are concerned with this important subject. Attention is paid to milk production on the farm, the disposal of milk, co-operative cheese schools, and the commercial possibilities of lactose from whey. A short account is also given of the instruction in dairying provided by local authorities. On the subject of clean milk production, it is stated:—

"To a considerable extent the Ministry has concentrated its energies on this subject during the past three years, and it is satisfactory to be able to record a noteworthy improvement in the conditions of milk production throughout the country. The expert advisers on the staffs of Local Education Authorities and Agricultural Colleges are able to help in this movement to a very important degree, and their efforts have been supported by agricultural societies and other bodies, who have devoted much attention to the question of methods of milk production at their annual shows and in other directions. Nor must it be forgotten that milk dealers themselves are now, for the most part, keenly alive to the necessity for securing increased cleanliness in milk, in the interests not only of the general public, but of the trade itself. In fact, this general awakening on the part of commercial interests may well prove to have an influence as great as that of the educational efforts of local bodies. If the trade could see its way to buy milk on the basis of cleanliness, it would go far to solve the problem of clean milk production."

Small Live Stock.—The portion of the report devoted to small live stock deals mainly with poultry. The general machinery for the provision of instruction in this subject along modern lines is explained, and an account is given of the National Poultry Institute Scheme, towards the cost of which the poultry industry, consisting mainly of "small men" with comparatively little capital, has contributed over £6,000. Two further schemes for the improvement of poultry stock are described, namely, the Egg and Chick Distribution Scheme and the County Egg Laying Trials, both carried out under the auspices of the local authorities.

Live Stock Improvement.—The report next records the satisfactory progress that has been made in the Live Stock Improvement Scheme. The advance is most marked in milk recording, the number of cows recorded increasing from 97,903 in 1920-21 to 138,086 in 1923-4, notwithstanding the hampering restrictions during this period consequent on the serious outbreaks of foot-and-mouth disease. The demand for premium bulls and boars has also steadily grown. The grants for heavy horses which were withdrawn for reasons of national economy after the year 1921-22 have been revived during 1924-25. A decrease has been recorded each year in the number of stallions licensed under the Horse Breeding Act, 1918. There is reason to believe that as a result of the working of this Act unsound stallions which formerly travelled at low fees have practically been eliminated from the road.

The report concludes with a short note on the National Stud, the operations of which continue to be satisfactory, the accumulated trading profit being £30,050. In 1922, the National Stud headed the list of Winning Breeders with 25 horses winning 42 races of the total value of £32,939.

R.C.V.S.—Obituary.

Pierce, Benjamin Dwight, 47 High Street, Springfield, Mass., U.S.A. Graduated Edin., 14th July, 1882. Died 4th November, 1925.

Bennett, John William, 89 Church Street, Leigh, Lancs. Graduated N. Edin., 26th January, 1884. Died 29th December, 1925.

Personal.

Will: Mr. Frederick George Samson, Upper Mitcham, S.W., veterinary surgeon, gave £100 to the Royal College of Veterinary Surgeons—£19,051.

Agricultural Advisory Committee for England and Wales.*

Report (No. 11) to the Councils of Agriculture for England and Wales on the Proceedings of the Agricultural Advisory Committee covers the proceedings at two meetings which have been held since the last report was presented, namely, those on 1st July and 7th October, 1925.

(1) *Sheep Scab.*—The Committee considered the Ministry's new proposed policy in regard to sheep scab as set out in a Draft Order which was placed before them. The basis of these proposals is the general compulsory double dipping of all sheep in the country, accompanied by movement restrictions, limited to a comparatively short period of each year (15th July to 31st August), the remainder of the year being free from restrictions or from the requirements of dipping on movement. The new plans, however, provide for the exemption of whole counties which have been free from scab for the preceding two years, subject to proper conditions which will safeguard such counties against the risk of the re-introduction of the disease. The matter was carefully discussed by the Committee and the proposals in general agreed.

(2) *Register of Movements of Live Stock.*—A further Draft Order was considered and agreed to by the Committee provided that it was ensured by it that in the event of an outbreak of foot-and-mouth disease through a dealer's cattle, the dealer could be traced through the register, even though he had no settled abode or premises in this country. The object of the register is to provide a more complete means of tracing animals in outbreaks of foot-and-mouth disease.

(3) *Compulsory Registration of Bulls.*—The Ministry placed before the Committee a scheme for consideration in which the following were the chief points:—

(1) No bull over ten months old to be used for service unless licensed; (2) Ministry's officers to carry out licensing and examinations; (3) bulls to be taken, if practicable, to centres for examination and not dealt with on owner's premises; (4) licensed bulls to be properly earmarked; (5) appeals in regard to rejected bulls to be heard by a panel of referees in the county; (6) owners of rejected or unsound bulls to be required to slaughter or castrate them; (7) a fee of 10s. to be charged for licences if bull examined at home, and 5s. if examined at prescribed centre.

The scheme was considered, and the Committee expressed itself in favour of the Minister proceeding with the scheme and having a Draft Bill prepared which would come before the Committee for their further consideration.

(4) *Reduced Compensation in Certain Foot-and-Mouth Disease Cases.*—The Committee considered and approved a proposal put before them by the Ministry not to accede to the suggestion to pay a reduced scale of compensation for seriously-diseased animals in foot-and-mouth disease cases in order to encourage farmers to report earlier and so save the spread of the disease.

(5) *Tuberculosis Order.*—The Committee considered the Draft Tuberculosis Order and approved it.

(6) *Detention of Cattle from Ireland.*—It was agreed that the position in regard to foot-and-mouth disease had improved sufficiently to permit of reversion to the statutory period of six days' detention in the case of cattle from Ireland in place of the 28 days which had been substituted during the time when foot-and-mouth disease was so generally prevalent.

(7) *Foot-and-Mouth Disease.*—At their meeting on the 7th October the Committee considered the position in regard to the recent outbreak of foot-and-mouth disease at three centres in the South of England. In view of the menace which threatened the country by reason of the very large increase of outbreaks recently on the Continent, it was decided that the various possible channels by which infection could be brought from the Continent should be again closely examined with a view to a reduction of our risk.

(8) *The Use of Arsenical Sheep Dips.*—The question was raised whether the use of arsenic in the sheep dips approved under the Ministry's Sheep Scab Order, should be allowed in view of the recent deaths which had been attributed to the excessive and ill-advised use of arsenic. It was agreed that the general authority to use arsenical sheep dips should be withdrawn and only dips with a very small percentage of arsenic permitted for statutory dipping under the Scab Orders.

* Reprinted from the *Journal of Ministry of Agriculture and Fisheries*, December, 1925.

The Ministry of Agriculture has undertaken to publish a series of monographs, the purpose of which is to give, in the language of everyday life, an account of work at the Agricultural Research Institutes of this country, and to explain the bearing of the results of research upon practical agriculture.

The first monograph of the series is entitled "Studies Concerning the Handling of Milk,"* and was prepared by Dr. Stenhouse Williams and the staff of the National Institute for Research in Dairying. That book has already reached a second edition, and the welcome given to it encourages the hope that the subsequent monographs will receive a like cordial reception.

The second monograph, written by Dr. F. H. A. Marshall and Mr. J. Hammond, is based upon research into the physiology of reproduction in farm animals, conducted at the Animal Nutrition Institute at Cambridge. The title of the work is "The Physiology of Animal Breeding with Special Reference to the Problem of Fertility."† The importance of the subject to farmers and stock-breeders needs no emphasis. A proper understanding of the conditions governing the fertility of the animals with which they are concerned is essential to the conduct of their business. There is no reason why every breeder should not become acquainted with the important results of modern investigation. Except for the preliminary physiological descriptions which are indispensable to the understanding of the rest of the volume, the monograph is entirely practical in its bearing. There are nine illustrations, and separate sections are devoted to the mare, the cow, the ewe, the sow, and the smaller farm animals.

Several other monographs are in course of preparation.

* Research Monograph No. 1, obtainable from the Ministry. Price 1s., post free.

† Research Monograph No. 2, obtainable from the Ministry. Price 2s., post free.

Inspection of Cows and Public Health.

At a recent meeting of the Berkhampstead Rural Council, the Clerk read a letter from Captain A. C. Wilson, M.R.C.V.S., stating that he regretted the action of the Council in terminating his appointment as Veterinary Inspector of Cows. He was surprised at the Herts County Council advising that such an appointment was no longer necessary, as he considered it a decidedly retrograde step in the campaign against tuberculosis among cattle. The discovery of and proper handling of such disease was of enormous benefit to the dairy farmer, and a great boon to public health. The periodical inspection of cows was, in his opinion, more essential than ever, and the notification of cases of tuberculosis by no means did away with the desirability of inspection. His attitude was influenced not by selfish motives, but solely from a sense of public duty. He would like a copy of the County Council's letter in order that he might communicate with them on the subject.

The Chairman : Why should we assume that there will be no periodical inspection under the County Council as there was under us ?

Mr. Ashby said that Captain Wilson, who was the officer appointed under the new Act, could not inspect unless he had suspicions that there were cases of tuberculosis among the cattle.

Mr. Turner : The point is, that now that it has become a notifiable disease the onus is on the cowkeeper.

Mr. Ashby : It is our duty to protect the public, and, with every respect to farmers, not one in twenty would know if a cow were suffering from tuberculosis of the udder. It requires an expert to diagnose such cases.

Mr. Turner : What is the use of a quarterly inspection of cows to discover disease which the cowkeepers must notify ?

Mr. Ashby : A quarterly inspection is better than no inspection at all, because the owner may not know that any of his cows have tuberculosis, and still passes the milk to the consumer.

Mr. Turner said that he was not adverse to inspection in the interests of public health, but if they continued it the cowkeeper might argue that it relieved him of any responsibility.

Mr. Ashby : For the safeguarding of the public I think it is advisable that an expert should continue to make periodical tests.

The Clerk explained that the origin of the subject was that the auditor said that the quarterly inspection was unnecessary now that the notification of the disease was compulsory, and the County Council took the same view.

The Chairman : We have been reminded that it is now a notifiable disease, and I suppose we had better leave it as it is.

The Clerk : Perhaps Mr. Ashby will mention it to the County Council.

Mr. Ashby : I will certainly do so. I am not satisfied to leave the matter as it stands now.

Mr. Turner thought the Ministry of Health should be appoached with regard to it. Periodical inspections were desirable provided they did not rid farmers of their responsibilities under the new Act. It did not seem much use making a disease notifiable if there were no means of detecting cases.

Mr. Ashby : It needs an expert to diagnose it.

It was decided to take no further action at present, but Mr. Ashby undertook to raise the matter at the County Council.

Cruelty to Calves.

WRONG WAY OF UNLOADING.

At the Mansion House, on December 30th, Sydney Herbert Mason, of Queen's Road, Peckham, and Thomas Arthur George Hawkins, of Over Place, Lambeth, were each fined £5 with 21s. costs, for cruelly ill-treating fourteen calves.

It was stated by Mr. A. Gordon Jones, counsel for the R.S.P.C.A., that, in consequence of complaints, two inspectors of the society kept observation on a slaughterhouse at Little Somerset Street, Aldgate, on December 10. They saw a motor lorry in charge of the defendants discharging calves. The tailboard of the van was let down to about two feet from the ground, and the calves were driven off the floor of the van on to the tailboard, and thence to the ground. Other calves on a shelf in the van, 3ft. 6in. from the floor, were driven off on to the tailboard in the same way. No attempt was made to help the animals, some of which were only two or three days old and not able to walk, and there was no straw or other bedding to save the shock of alighting, so that they had to jump or fall on the slippery cobble stones. Of seventeen calves which were seen to leave the van, seven fell on their sides, three on their knees and heads, and seven on their feet. Two of those which fell on their sides caught their legs in the chains holding the tailboard. One of the inspectors told the defendants they would be summoned for causing pain to fourteen calves owing to the brutal manner in which they had unloaded them. Mason said, " If you knew anything about unloading calves you would not be so silly. Come and unload them yourself." Counsel contended that the young calves should have been lifted out, and that litter should have been spread on the stones for the other calves to jump on. The tailboard of the van should also have been lengthened.

A drover, called for the defence, asked by the Lord Mayor why no straw was spread on the ground, replied, " The question is—who is going to pay for it ? " (Laughter).

Defendants said they unloaded the calves in the usual way and did not commit any cruelty. It was no good putting straw down because the animals kicked it away.

The Lord Mayor said there was no doubt that cruelty had been committed. Owing to the fact that the men's employer had promised to lengthen the tailboard of the van, and to put something on the ground for the calves to fall on, he (the Lord Mayor) would not send the men to prison, but would fine them.

The employer paid the fines and the costs.—*Daily Telegraph.*

Erratum : In the Abstractor's Note at the conclusion of " Vitamin A in Beef, Pork and Lamb " (p. 14, Vol. vi.), the last sentence should read : " Hence it is probable that *some* (not ' none ') of the vitamine A content of the meats was destroyed by the method of preparation *used above* (not ' of the latter '), thereby vitiating the results obtained."

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

January 11th—R.C.V.S. Issue of Overseas Voting papers for annual election of Council.

„ 12th—Meeting of the Derbyshire Division at Derby.

„ 14th—Meeting of the Central Division, 10 Red Lion Square, W.C.

„ 15th—Annual General Meeting of the Mid-West and South Wales Division at Bristol.

„ 21st—R.C.V.S. Special Meeting of Council.

March 31st—Garnett Memorial Fund—Closing Days

April 1st—R.C.V.S. Annual Fee of £1 1s. 0d. due.

„ 8th—R.C.V.S. Committee Meeting.

„ 9th—R.C.V.S. Committee Meeting ; Council Meeting 2 p.m. ; Garnett Memorial Fund Committee Meeting.

Animal Diseases Research Association.

Professor S. H. Gaiger, Director of Research of the Animal Diseases Research Association of Scotland, has formally intimated to the President, Mr. Falconer L. Wallace, of Candacraig and Balcairn, his resignation from the Animal Diseases Research Association on the grounds that he has been offered and has accepted an appointment to a new chair in the University of Liverpool, where a department of research in animal pathology is to be founded.

Steps are being taken to obtain applications for a successor to Professor Gaiger as Director of Research in the Animal Diseases Research Association. Applications will in the first instance be considered by the Technical Advisory Committee to the A.D.R.A., and the Directors will be summoned in due course to consider these applications with the assistance of the Technical Advisory Committee and to make an appointment.

Frank Garnett Memorial Fund.

Twenty-first List of Subscriptions.

	£	s.	d.
Amount brought forward from twentieth list	430	17	6
H. H. Truman	1	1	0
H. & T. Lepper	1	1	0
	2	2	0
	£432	19	6

Donations should be made payable to the Frank Garnett Memorial Fund, and sent to the Hon. Secretary, 10 Red Lion Square, London, W.C.1.

Foot and Mouth Disease in Texas.

"For the first time in its history a new outbreak of foot-and-mouth disease has appeared in the United States before the complete eradication of the last preceding outbreak. At least, it appears that the recent outbreak at Houston has no connection with the California enzootic, notwithstanding the Texas quarantine against importation of animals from California had been lifted only one week when the disease appeared in Texas.

"Little apprehension of the spread of the Texas outbreak is felt by the officials. The disease was discovered when it existed in only three herds and the forces of the Federal Bureau of Animal Industry quickly mobilized for its suppression. The outbreak occurred in a settled portion of the country, where cattle are kept in fenced enclosures and are used to handling. The co-operation of the Texas officials with the federal forces is complete, and little difficulty in enforcing quarantine is expected.

"Dr. Marion Imes, of the Bureau of Animal Industry, was placed in general charge of the state and federal eradication forces, effective October 1st. The federal force numbers 45 inspectors trained in foot-and-mouth disease control work. In addition to its co-operation of a veterinary nature, the state has detailed a detachment of its famous Texas rangers to the quarantined area. These men will see that stockmen and the public comply with quarantine regulations to the last detail.

"The three infected herds, containing a total of 1,900 cattle, have all been slaughtered and buried. As a precaution, poisoned baits have been used freely for the destruction of coyotes and other roving animals. A corps of riders and guards is likewise on duty to prevent the straying or drifting of cattle in the region. As the period of incubation of foot-and-mouth disease is from two to twenty-one days, depending upon the kind of exposure, department veterinarians withhold judgment as to the proportions the outbreak may assume.

"The Ellington Aviation Field, near Houston, Texas, and in the quarantined area, is bordered on two sides by infected pastures. The War Department has instructed the commanding officer to co-operate with Doctor Imes in any measure necessary to prevent the spread of the disease, even to the extent of closing the field entirely. The principal danger, department officials explain, is not so much in the movement of airplanes, as might be inferred, but in the spread of infection by visitors to the field, and employees and vehicles engaged in the movement of supplies.

"The excellent co-operation in combating the outbreak is illustrated by the public-spirited attitude of the cattle owner whose herd was the first to be condemned. The herd belonged to Rev. William S. Jacobs, pastor of the First Presbyterian Church in Houston, and a breeder and fancier of Brahman cattle. These are the hump-backed cattle of India, which are raised extensively in south-east Texas. The satisfactory appraisal of such cattle offers difficulties not met with in placing values on stock of the more common breeds. Doctor Jacobs, however, expressed his desire to have the herd slaughtered promptly to prevent the possible spread of infection, remarking that the question of valuation could be settled later.

"While a number of states have issued quarantine orders prohibiting the entry of certain products from Texas, such quarantine orders have not been so drastic as some of those promulgated during the California outbreak.

"The Texas outbreak is the eighth appearance of foot-and-mouth disease in this country. The first was in 1870, the second in 1880, the third in 1884, the fourth in 1902, the fifth in 1908, the sixth in 1914, the seventh in February, 1924, and the present one which was discovered September 26th."— *Veterinary Medicine*, Chicago, November, 1924.

Bovine piroplasmosis, or as it is more generally termed, "the yellows," is the main obstacle to cattle rearing and improvement in Algeria.

Thornton, after the examination of specimens of *Ascaris lumbricoides* from both pigs and chimpanzees, has reached the conclusion that the same parasite affects both animals, and also, of course, man.

The Reputed Medicinal Properties of Animal Stones.

Dr. Eric Ponder, in a recent issue of *The Pharmaceutical Journal and Pharmacist*, gives the following interesting description of "animal stones" as remedies, which, he says, "represent the high-water mark of mediæval superstition.":

"The Aquilaeus is to be found in the stomach of the eagle, or at times in its nest. It is especially good for epilepsy, and is a specific for abortion, to prevent which it is to be bound on the arm. But it may also be used to facilitate delivery, in which case it should be bound on the thigh.

"The Alectorius is a crystal-like stone found in the stomach of the cock, and has many uses. Its owner is rendered brave and invincible, and by its means wedded love is preserved—or, as some writers have it, it makes the woman more agreeable to her husband. Its principal medicinal use is to assuage thirst.

"The Aquilinus is said to be found in a fish. It cures ague, and should be drunk in asses' milk, or else bound on the brow.

"The Asinus may be discovered at 'fortunate times' in the heart of the wild ass. Epilepsy and headaches yield to its application, and, in children, it removes worms.

"The Asphilates has a specific effect on the spleen, especially if mixed with camel's dung. It is to be found in the nests of certain Arabian birds; which, I am unable to discover.

"Benzoar is a calculus found in the cat and in the cock, and is a powerful safeguard against infection.

"The Chelidonius, a wonderful concretion found in the swallow, cures all fevers if hung about the neck in a yellow cloth.

"Doriatiles is to be taken from the sea-cat, the head of which is to be cut off 'suddenly' and thrown to the ants to eat. When the ants have finished, the Doriatiles will be seen inside the skull. It must have been of great value in medicine, for it possesses the property of giving the owner anything he wants.

"The Obsianus is to be removed from the head of a panting dragon. It cures all manner of poisonings.

"The Hyena, taken from the eye of the hyena, cures gout and all sorts of fevers and agues.

"The Limachie, contained in the head of the slug, cures fevers."

R.C.V.S. Fellowship Diploma.

An Examination for the Fellowship Diploma was held at 10 Red Lion Square on Saturday, January 2nd, when the following candidate was successful:—

Herbert Henry Curson, F.R.C.V.S.

Thesis: "Some Little Known South African Poisonous Plants and their Effects on Stock."

Examiners: Dr. W. J. Dilling, M.B., Ch.B., and Dr. G. D. Lander, D.Sc.

Sir John Moore, K.C.M.G., C.B., F.R.C.V.S., Chairman.

CORRESPONDENCE.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

The Tuberculosis Order.

To the Editor of The Veterinary Record.

Sir,—Many recent papers and discussions on the above have been published in *The Veterinary Record*, and they give a mutual feeling of hopefulness in the profession that good will accrue from the working of the Order.

From the practitioner's point of view, the diagnosis of tuberculosis and the application of the tuberculin tests are interesting, as it is very often his duty to advise owners of stock as to whether cases should be reported under the Order or not.

Overlapping at this point can occur between the appointed inspector's and the practitioner's duties and, while it is incumbent upon the inspector to enquire into reportable cases and to diagnose reported cases, I think that he should—provided he is in an independent position (preferably a whole-time inspector)—encourage as many of his reported cases as possible to be reported through the owner's veterinary practitioner.

My reasons for this suggestion are—that a tuberculous animal has not suddenly reached the stage of health when it is reported under the Order. The owner's practitioner is in a position to advise his client whether he should report—he advises from a duty point of view—he is in a position to benefit from the previous history of the animal's health—he can explain in some cases the necessity of applying the tuberculin test, both to guard his own opinion and confirm his diagnosis.

The owner's interpretation of the cases he is to report allows him such latitude that he may report cases which should not have been reported—speaking apart from the "waster" type of animal—with resulting expense in carrying out the Order, and in many cases with no benefit to the owner.

I think, therefore, that as far as possible a working understanding of the cases which have been reported to the local authority should exist between inspector and practitioner, and which will lead to more beneficial results.—I am, Sir, yours faithfully, William Tweed.

January 4th, 1926.

National Veterinary Medical Association of Great Britain and Ireland.

EDITORIAL OFFICE: 10 Cray's Inn Square, London W.C.1.

All communications relative to the literary side of the Veterinary Record must be addressed to the Assistant Editor, "Veterinary Record," 10 Cray's Inn Square, W.C.1

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